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Optical properties of a reversible phase transition of sol-gel-produced La₂NiO₄ thin films KELLER ANDREWS, ANTHONY KAYE, Department of Physics and the Nano Tech Center, Texas Tech University — Many materials undergo ultrafast solid-solid phase transitions characterized by unusual changes in their physical properties across their phase transition. There is some evidence that the class of materials that take the form Ln₂MO_{4+δ} (Ln = La, Nd, Sm, Eu; M = Ti, Co, Ni, Cu) may exhibit such a transition when the materials are heated above room temperature and at certain levels of oxygen saturation (δ). Earlier studies of La₂NiO_{4+δ} have shown a large change in conductivity near 250 degrees C, but the optical properties of thin films of materials fitting this pattern have gone virtually unmeasured. Here, we present the results of several electrical and optical experiments characterizing sol-gel-produced thin films of two of these materials that explore the region between 400 nm and 2.4 μ m at temperatures between 20 and 400 degrees C.

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